



Department of Toxic Substances Control



Winston H. Hickox
Agency Secretary
California Environmental
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N00236.001916
ALAMEDA POINT
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Gray Davis
Governor

May 13, 2003

Ms. Glenna Clark
Department of Navy
Southwest Division
Naval Facilities Engineering Command
1230 Columbia Street, Suite 1100
San Diego, CA 92101

**DRAFT REMEDIAL INVESTIGATION REPORT, OPERABLE UNIT 6, SITE 26,
ALAMEDA POINT, ALAMEDA, CALIFORNIA**

Dear Ms. Clark:

The Department of Toxic Substances Control (DTSC) has reviewed the above referenced document dated February, 2003. Our comments are attached. Should you have any questions, please contact me at 510-540-3767.

Sincerely,

Marcia Liao, Ph.D., CHMM
Hazardous Substances Engineer
Office of Military Facilities

enclosure

Mr. Glenna Clark

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cc: Michael McClelland, SWDiv
Andrew Dick, SWDiv
Steve Edde, Alameda Point
Mark Ripperda, EPA
Judy Huang, RWQCB
Charlie Huang, DFG
Elizabeth Johnson, City of Alameda
Peter Russel, Northgate Environmental
Randolph Brandt, LHF
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Carol Yamane, Bechtel

DTSC COMMENTS
DRAFT REMEDIAL INVESTIGATION REPORT
IR SITE 26
ALAMEDA POINT, ALAMEDA, CALIFORNIA

PART I: COMMENTS FROM THE OFFICE OF MILITARY FACILITY (OMF)

GENERAL COMMENTS

RCRA Corrective Action

1. Alameda Point is a Part B hazardous waste facility subject to RCRA corrective action. It is our understanding that the Navy prefers an integrated CERCLA/RCRA approach and this Remedial Investigation (RI) report is intended to satisfy both CERCLA and RCRA requirements for site cleanup. To achieve this goal, we recommend the following:

- Clearly state that one of the purpose and objectives of this RI is to satisfy the RCRA corrective action requirements.
- Clarify that this RI address not just CERCLA constituents but also hazardous constituents as defined by Title 22 of California Code of Regulation (CCR) section 66260.10. This, in essence, means that both petroleum substances (exempt from CERCLA but regulated under RCRA) and radiological materials (not regulated under RCRA but covered under CERCLA) will be addressed.
- Satisfactorily determine the potential of releases of hazardous constituents from past navel activities at IR Site 26 (also see Comments #2 through 6).

Release of Hazardous Constituents

2. The RI states that previous Navy studies have identified two areas impacted by past activities: the area southeast of Building 20 and the area southwest of Building 23. Consequently the RI has focused on these two areas.

Please explain the agency concurrence status on these studies (i.e. the identification of impacted areas). Also, for clarity, please provide pertinent data to allow the readers conclude more easily that IR Site 26 has been adequately evaluated and that the areas around Buildings 20 and 23 are indeed the only two impacted areas at IR Site 26.

Please refer to DTSC April 11, 2003 comments for Site 14/15 draft final RI for further details regarding areas of concerns (AOCs). For adequacy of evaluation, please see Comment #4 below.

3. Historically, IR Site 26 operations have included aircraft parking, maneuvering, wash down, fueling, and maintenance, as well as support activities including paint and primer spraying, missing, and storage; solvent storage and use; and storage and use of adhesives, detergents, alcohol, and sealers. Work stations, chemical storage areas, and waste collection points were located across the four hangars (Buildings 20, 21, 22, and 23), the paint and finishing building (Building 24), and more than 20 ancillary buildings. Stains were observed on the floor according to the Environmental Baseline Survey (EBS). Relatively few samples have, however, been collected inside the buildings. Please explain why areas inside the buildings are not considered areas of concern for IR Site 26.
4. Widespread stains were observed in the open spaces at IR Site 26 according to the EBS. Numerous soil samples were collected across the site during the EBS as a result. To facilitate the review of sampling adequacy, we recommend the following:
 - Describe the historical activities taking place at the open space areas.
 - Provide soil plots that show the sampling locations based on the type of contaminants (e.g. VOCs, SVOCs, metals). Please note that although Figure 3-2 depicts the sampling locations prior to and during the RI, it does not differentiate between different types of contaminants. As a result, it is rather difficult to use Figure 3-2 to determine how well IR Site 26 has been investigated for a given type of contaminant.
 - Provide soil and groundwater data according to the type of contaminants. Appendices A and H, as currently presented, are not organized this way and, as a consequence, are rather difficult to use for locating data for any given type of contaminant.
5. IR Site 26 is approximately 32 acres with approximately 1 acre of unpaved area. Aerial photos show stains were present in various areas before the pavement was installed. Please discuss the extent of release occurred before the site was paved. Please explain if these releases have been adequately assessed.
6. Please clarify if there were industrial waste sewers present at IR Site 26. If so, please locate them on the map (Figure 1-3) and summarize the investigation and cleanup results.

7. For accuracy, please reword the statements that previous studies as well as the RI have identified the area southeast of Building 20 and the area southwest of Building 23 as the two areas impacted by past naval activities (e.g. page ES-5, page 6-1). It is our understanding that the RI, based on previous studies, has focused the sampling primarily in areas around Buildings 20 and 23. The RI itself did not identify these two areas as impacted areas.

Nature and Extent of Contamination

8. For discussion of the sources and the nature and extent of contamination, it is our opinion that all detected constituents are chemicals of interest until determined otherwise.

Assuming all areas of concerns at IR Site 26 have been sufficiently sampled and analyzed, to identify chemicals of interest the following are recommended: 1) Plot all detected concentrations on a map, examine them spatially and in relation to the AOCs (for inorganic metals it should be all concentrations detected above background), 2) review groundwater data and compare the soil plot with the groundwater plume map, if available, and 3) compare the data to screening values such as EPA Region 9 preliminary remediation goals (PRGs) and maximum contaminant levels (MCLs). We do not believe screening numbers such as the PRGs should be used as the sole basis for the selection of chemicals of interest.

Please refer to DTSC April 11, 2003 comments for Sites 14 and 15 draft final RI for more discussion on the determination of chemicals of interest.

9. Given that volatile organic chemicals (VOCs) are present in elevated levels in groundwater, please explain why VOCs are not considered chemicals of interest for the soil.
10. Given that soil VOC data collected during the EBS were of questionable quality (page 3-15), please explain why VOCs were not identified as chemicals requiring further investigations in the RI.
11. According to the RI (page 3-14), metals, pesticides, and PCBs, along with VOCs, were not identified in the EBS as chemicals requiring further investigations. Please elaborate the criteria for identification. Please indicate agency concurrence on this.
12. For completeness, please include sewer line investigation in the discussion. Residual radiological contamination, if any, must be clearly presented in the RI.

13. Please clarify if groundwater samples collected during the EBS were found to contain pesticides, PCBs, and PAHs (see page 3-29).

Fate and Transport

14. Please substantiate the statement (see page 4-15) that it is unlikely that dissolved contaminants reported in groundwater will reach the bay or the harbor at significant concentrations due to natural attenuation mechanisms that reduce chemical concentrations.

Risk Assessment

15. Please clarify if EBS data were used in the risk assessment for IR Site 26. It appears that some parts of the report suggest they were (e.g. page 5-2 and ES-5) but other parts suggest otherwise (e.g. page ES-1). If EBS data were used in the risk assessment, please explain if it is consistent with the practice at other sites throughout the Base. It is our understanding that the risk evaluation at Sites 14 and 15 specifically excluded the EBS data.

Findings of Previous Studies

16. The report states that the RI results were combined with "selected" results from previous Navy studies to characterize the site and conduct risk assessment. Please clarify for the following:
 - What are these "selected" results or studies?
 - What criteria were used in the selection?
 - Have the selected results/studies (e.g. EBS, sewer line closure, and fuel line closure reports) been reviewed and concurred by the agencies?

Conclusion and Recommendation

17. For completeness, please include in the conclusion section that the contamination at the northern end of IR SITE 26 is associated with the neighboring fuel loading station at Parcel 37 and is being investigated and remediated under the Navy's total petroleum hydrocarbon (TPH) program.
18. Please explain why the soil at Building 20 wash down area is not considered a continuing subsurface source requiring remediation.

SPECIFIC COMMENTS

1. ES-3, last paragraph: The 1991 RCRA facility assessment was conducted by DTSC, not by the Navy. Please correct it.

2. Page 1-16, paragraph 1 states, "In 1990, A RCRA facility assessment (RFA) completed by IT ...". IT should be DTSC.
3. Page 1-16, Bullet 1 states that DTSC acceptance of closure certification dated January 21, 1998 includes Building 24 industrial wastewater treatment plant (IWTP 24) as well as the associated generation accumulation point (GAP) site. This is incorrect. The subject closure certification is for IWTP 24 only. It does not include the GAP. The *No Further Action* determination for the GAP is mostly likely contained in the DTSC comment letter dated August 25, 1999. Please check it.
4. Please correct the following errors for Table 1-1:
 - Building 582 has been entered twice for Parcel 192.
 - Building 537 is listed for both Parcel 35 and Parcel 192 with different past use.
 - Buildings 314 and 335 are shown as "present" but with a superscript "b" indicating location unknown.
5. Table 1-1 has listed a number of buildings/structures that are not shown in Figure 1-3. Examples include 24A, 516, 536, 549, 329, 554, 316, 319, 582, and 540. Please make sure all buildings/structures listed in Table 1-1 are adequately shown in Figure 1-3. Please differentiate buildings/structures that are still present today from those that have been removed. For buildings/structures of unknown location, please consider to approximate the location in dotted lines.
6. Figure 1-3 does not identify all buildings/structures that are shown in the figure. Examples include three buildings or structures west of Building 20, 21 and 22 and two buildings east and south of Building 24. Also, please clarify what "26B15" is (see the south east corner of Building 22).

PART II: COMMENTS FROM THE GEOLOGICAL SERVICES UNIT (GSU)

Please see the attached GSU memo dated May 8, 2003.

PART III: COMMENTS FROM THE HUMAN AND ECOLOGICAL RISK DIVISION (HERD)

Please see the attached HERD memo dated April 23, 2003.



Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Department of Toxic Substances Control

Edwin F. Lowry, Director
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Gray Davis
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MEMORANDUM

TO: Marcia Liao, Ph.D. CHMM
Hazardous Substances Engineer
Office of Military Facilities

FROM: Michael Kenning, RG
Hazardous Substances Engineering Geologist
Geologic Services Unit

REVIEWED BY: Mark Vest, CEG
Senior Hazardous Substances Engineering Geologist
Geologic Services Unit

DATE: May 8, 2003

SUBJECT: REVIEW OF THE DRAFT REMEDIAL INVESTIGATION REPORT,
IR SITE 26, WESTERN HANGER ZONE, ALAMEDA POINT,
ALAMEDA, CALIFORNIA.

ACTIVITY REQUESTED

At your request the Geologic Services Unit (GSU) has reviewed the geological aspects of the three volume Draft Remedial Investigation Report, IR Site 26, Western Hangar Zone, Alameda Point, Alameda, California. The February, 2003 report was prepared by Bechtel Environmental, Inc. for the Southwest Division, Naval Facilities Engineering Command.

SUMMARY/GENERAL COMMENTS

- 1) Field work for the Site 26 Remedial Investigation (RI) was conducted between February and December, 2002. Much of the earlier site characterization work was

conducted under Environmental Baseline Survey (EBS) investigations, the results of which are tabulated in the RI report. According to the RI report (last paragraph on page 1-10), a site specific EBS was completed in October 1995 for EBS parcel 192 which surrounds Building 20. Grab groundwater samples from boreholes were analyzed for Volatile Organic Compounds (VOCs) and the data are presented on Figure 3-5, along with VOC data from 2002 sampling. Because the concentrations of chlorinated VOCs (CVOCs) are above comparison or health based criteria, GSU recommends that permanent groundwater monitoring wells be installed in the fill and monitored for constituents of concern, including additional compounds stated in the following paragraphs of this memo. The wells are also needed to establish groundwater flow directions in this area. The general groundwater flow direction is easterly based on monitoring wells located south and west of Building 23, but those wells are approximately 1100 feet to the south of the plume near Building 20. It is possible that contaminated groundwater has migrated under Building 20. It is also possible that contamination has migrated to the underlying Bay muds and Merritt sand because the CVOCs are denser than water. GSU recommends that groundwater in these zones be sampled and analyzed for the appropriate constituents of concern. In general, the extent of contamination has not been determined for this parcel.

- 2) The intent of the RI/FS process is to gather information sufficient to support risk management decisions and remedial alternatives. Storm sewer segments under Site 26 have been investigated and decontaminated and are not included in this RI apparently because no significant contamination remains from radiological wastes that originated from Building 5 east of IR26 and discharged to the storm sewer. Wastes generated from operations in Site 26 were also discharged to the storm sewer. If data gathered from the sewer investigation is not provided in the RI report, it is not clear how informed decisions regarding risk management and remedial alternatives can be selected. GSU recommends that this data be included in the RI report.
- 3) 1,1,1-TCA at 18 ug/l was detected in a groundwater sample at a depth of 5 feet from Boring 26B50, the only boring from which this compound was detected. In the same boring 1,1 DCA was detected at 190 ug/l and at 160 ug/l in a nearby boring from 1995. It is possible that 1,1-DCA may be a daughter product of 1,1,1-TCA. If 1,1,1-TCA was one of the solvents used at this site, then there is a concern that 1,4-dioxane is present in the groundwater. TCA has been reported to contain several percent of 1,4-dioxane, which is soluble in water and is also resistant to biodegradation in soil and groundwater. The PRG tap water concentration for 1,4-dioxane is 6.1 ug/l. Although 1,4-dioxane has not been reported in VOC analysis completed to date, the detection limit for this compound is normally about 100 ug/l or higher, unless alteration of the 8260B test method is employed. Because this compound is persistent in the subsurface environment and because little is known

of the quantity of these compounds that have found their way into the subsurface over the past several dozen years, GSU recommends that future analysis for VOCs include 1,4-dioxane at low detection limits.

- 4) Table 1-1 lists buildings within each parcel and other information such as construction date and past use. Pyrotechnic materials were stored in buildings in Parcels 191 and 192. Pyrotechnics include flares, smoke generators, fuses, and photo-flash compounds. Pyrotechnics are usually composed of an inorganic oxidizer and metal powder in a binder. There is a possibility that the inorganic oxidizer could be perchlorate. GSU recommends that this compound be analyzed in groundwater.
- 5) There is still significant benzene contamination in monitoring well 26SW05 (1000-1400 ug/l), southwest of Building 23. Monitoring well 26SW04 also has benzene contamination (23-68 ug/l). This well also has significant arsenic concentrations (50-71 ug/l). The extent of this contamination has not been determined. GSU recommends further investigation to determine the lateral and vertical extent of contamination.
- 6) Figure 3-5 also includes concentration contours for vinyl chloride. It is generally not appropriate to contour data collected nearly seven years apart. The green (5 ug/l) contour line is all right since it is based on entirely current (2002) data. GSU recommends that the dates of groundwater sampling be clearly indicated on this map and that dashed lines be used for the blue (0.5 ug/l) contour line since older and recent data was used along the western part of the contour. Also the depths at which the grab groundwater samples were taken should be indicated on the map.
- 7) Executive Summary, Page ES-2. A statement in the third paragraph asserts that the Merritt Sand aquifer yields saline to hypersaline water. Hypersaline waters would have a salinity substantially greater than seawater. Please provide a reference for this statement.
- 8) On Figure 2-2, soil borings are labeled as monitoring wells. Grab groundwater samples were taken from the borings, but they are not monitoring wells. Please add a symbol to the legend and map to indicate the borings.

If you have any questions, contact me by telephone at (916) 255-3625 or by e-mail at MKenning@dtsc.ca.gov.



Department of Toxic Substances Control



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TO: Marcia Liao, DTSC Project Manager
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FROM: James M. Polisini, Ph.D.
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DATE: April 23, 2003

SUBJECT: DRAFT REMEDIAL INVESTIGATION REPORT IR SITE 26,
NAVAL AIR STATION ALAMEDA
[SITE 201209-00 PCA 18040 H:36]

BACKGROUND

HERD has reviewed the document titled Draft Remedial Investigation Report IR Site 26, Western Hangar Zone, Alameda Point, Alameda California dated February 2003. This draft document was prepared by Bechtel Environmental, Inc. of San Diego, California.

Naval Air Station (NAS) Alameda was an active naval facility from 1940 to 1997. Operations included aircraft, engine, gun and avionics maintenance; fueling activities; and metal plating, stripping and painting. IR Site 26 is approximately 32 acres with approximately 1 acre of unpaved area. The remaining area is covered by concrete and asphalt pavement, four aircraft hangars, a paint and finishing building and several other smaller buildings. Underground fuel lines connected the four hangars to the fuel distribution system. A length of fuel line running east-west between buildings 23 and 24 was removed. During this removal action a break in the line was discovered southwest of building 23. The remaining cleaned lines running north-south along the western portion of the site were abandoned in place.

GENERAL COMMENTS

These comments are confined to Appendix I and J of the referenced Draft RI Report for IR26. These appendices contain the evaluation of 'background' concentrations and the Human Health Risk Assessment (HHRA). HERD assumes the DTSC Project Manager has checked the main text for consistency with these comments on the appendices.

SPECIFIC COMMENTS ON APPENDIX I

1. HERD never agreed that the three data sets labeled pink, blue and yellow (Section I1, page I-1) were representative of 'ambient' conditions particularly for organic compounds. Specific comments on the 'background' data set are listed below. This comment is included for historical accuracy and no response is required.
2. Previous soil depths for developing the Exposure Point Concentration (EPC) for the Human Health Risk Assessment (HHRA) have been 0 to 2 feet and 0 to 10 feet. If depth to groundwater should be less than 10 feet the soil groupings have been 0 to 2 feet and 0 to groundwater depth. Please explain the rationale for the 0 to 6 foot below ground surface (bgs) (Section I1, page I-1). If groundwater was always encountered at 6 feet this is sufficient justification.
3. A 'background' data set of six samples for the 0 to 2 bgs soils, some with a detection frequency less than 50 percent (Section I1, page I-2) would not appear sufficient to establish a criterion for evaluation of Contaminants of Potential Concern (COPCs). Perhaps the range of soil concentrations in the pink, blue and yellow areas could be compared. If the variance for certain elements is minimal, the data set might be combined to increase the sample size for the elements and improve the identification of areas of release at IR26.
4. The dot plots are useful in evaluating the comparison of 'background' concentrations to IR26 concentrations. The dot plots raise the following issues regarding the 0 to 6 foot 'background' data set:
 - A. HERD does not believe a maximum 'background' concentration of antimony of 8 mg/kg (Figure I-3) is representative of unimpacted soils when all IR26 soils are less than approximately 2 mg/kg antimony.

- B. The 'background' detected concentrations of beryllium (up to 1.5 mg/kg) greatly exceed the IR26 maximum concentration of 0.5 mg/kg (Figure I-3).
 - C. The maximum mercury concentration in the 'background' data in excess of 2 mg/kg does not appear representative of a 'background' concentration.
 - D. A maximum silver concentration in excess of 5 mg/kg does not appear representative of 'background' concentration, especially given the fairly small variation in the other detected 'background' silver samples.
5. There are three presentations of 'background' concentration comparisons against IR26 soil concentrations. There are dot plots of the 0 to 6 foot data (Figure I-3), box and whisker plots of the 0 to 2 foot soil comparisons (Figure I-4) and box and whisker plots of the 0 to 6 foot comparisons (Figure I-5). Please explain how it is possible for the maximum lead concentration in the 'background' data set to be in excess of 160 mg/kg (Figure I-5) when the maximum lead concentration shown for 0 to 2 feet is 70 mg/kg (Figure I-4). Please include a dot plot of lead in the 0 to 6 foot 'background' data set (Figure I-3) as this is the only possible source for the 160 mg/kg lead concentration given the information provided.
6. The lead in IR26 groundwater does not appear amenable to consideration of any 'background' concentration (Figure I-6) given the three 'background' samples with detected lead concentrations are less than the two detected IR26 concentrations.
7. There is no deliberate effort to overestimate risk (Section J, page J-2 and Section J4, page J-30) in human health risk assessments. There is an effort to be health protective. The summary statement (Section J6.5, page J-44) indicates that risk is 'more likely to overestimate than underestimate the potential risk', which is more accurate. Please amend these statements in the text.
8. The criterion which HERD agreed to when assessing Contaminants of Potential Concern (COPCs) (Figure J-1, page J-3) for a HHRA was that a comparison to one tenth the U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) could be used as long as no more than 10 COPCs were dropped from the final list to be evaluated. Please amend the footnote to this figure. Use of the agreed-upon criterion would only impact the 0 to 6 foot soil COPCs as 13 COPCs were eliminated from this group (Section J1.1, page J-16, Section J6.1, page J-40 and Section J6.4, page J-43).

9. The indication for ecological exposure pathways (Figure J-2) should be amended to O rather than an X to indicate that the exposure pathway is potentially complete, but of limited significance given the minimal unpaved or uncovered area at IR26.
10. The indication for dermal exposure under the office worker scenario (Figure J-2) should be amended to O rather than an X to indicate that the exposure pathway is potentially complete, but of limited relative significance. In many studies, measured concentrations of outdoor soil are relatively similar to indoor dust.
11. Please provide the number of discrete sample concentrations (Table J-8 through J-10) which were used in the bootstrap estimate of the Exposure Point Concentration (EPC) (Section J2.3.1, page J-19).
12. The Exposure Parameters (Table J-7, page J-12) were checked at random and found to be correct with one exception. Please provide the rationale for using a 100 day/year Exposure Frequency (EF) for residential adults. The value for the residential use scenario child is 350 days/year and it would seem reasonable that the adult residential use scenario EF would be the same.
13. Please verify that the sample detection limits for hexavalent chromium (Cr^{+6}) is at least as low as 0.005 $\mu\text{g}/\text{l}$ as listed (Table J-10, page J-25). For HERD's information please provide the reference for the standard method used to achieve this detection limit of Cr^{+6} .
14. Please indicate whether the maximum groundwater concentrations for benzene, isopropylbenzene, toluene and mixed xylenes are co-located (Table J-10). This may indicate that the sampling location is a candidate for remedial action.
15. HERD could not locate the specific soil parameters used in the Johnson and Ettinger model estimation of the indoor air concentrations for buildings 20 and 23. This model is particularly sensitive to the soil moisture and open pore space parameters. Please provide a table listing the site-specific soil parameters used to obtain the EPC for building 20 and 23.
16. Blood lead concentrations are the result of all routes of exposure, not just ingestion of water. However, given the lack of exposed soils as IR26 HERD accepts the comparison of groundwater to the

California drinking water action level of 15 µg/l (Section 4.3, page J-31). The current exposure singular evaluation of lead groundwater concentrations would not be acceptable at IR sites which have greater areas of exposed soil.

17. HERD does not believe that the specific 'risk management' range of 1×10^{-6} to 1×10^{-4} is contained in the National Contingency Plan (Section J5.1, page J-32). This 'risk range' was developed by U.S. EPA in an *a posteriori* of Superfund sites which had remedial action taken versus those for which no remedial action was performed. Please amend this reference.
18. The incremental cancer risk estimates for the residential use scenario, both considering use of groundwater and without groundwater use (Table J-14, page J-34 and Section J5.2, page J-37) indicate that a restriction on groundwater use for residences is required for IR26. The DTSC risk manager should confirm that the San Francisco Regional Water Quality Control Board (SFRWQCB) has determined that beneficial uses of the groundwater at NAS Alameda do not include residential use or office water supplies.
19. The second sentence (Section J5.2, page J-37) describing IR26 risk and or hazard as compared to Building 23 risk and or hazard appears to indicate that 'background' concentrations of organic compounds have been subtracted to provide a comparison for Building 23 and IR26. HERD would not agree to use of 'background' concentrations of organic compounds. If an adjustment was not made to compare Building 23, the text should be amended to reflect that only inorganic 'background' concentrations were subtracted for the Building 23 estimate or risk or hazard.
20. Please provide suitable rationale for use of an EF of 100 days per year in the Farmer's Model calculations (Table J1-1, page J1-3). Please see Specific Comment number 12 above.

CONCLUSIONS

The Human Health Risk Assessment incorporates a residential use, office worker use and construction use scenario. These three are more than sufficient to evaluate the risk and or hazard given the current lack of open space at IR26. The majority of the risk and or hazard is associated with residential or office worker use of groundwater. If the San Francisco Regional Water Quality Control Board will verify that beneficial use of the groundwater does not include residential or drinking water uses (i.e., the

aquifer is non-potable) risk and or hazard is within the risk management range of 1×10^{-6} to 1×10^{-4} .

No Ecological Risk Assessment appears to be required for IR26 given the small area of exposed soil and vegetation.

cc: Sophia Serda, Ph.D.
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